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SMALL GAME HARVEST AND CHARACTERISTICS OF SMALL GAME HUNTERS IN MICHIGAN, 2004

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Abstract

A sample of small game license buyers was contacted after the 2004 hunting seasons to estimate the number of people hunting small game, their days afield, and harvest. The survey also was used to investigate factors affecting hunter recruitment and retention. In 2004, about 210,000 people hunted small game species, nearly identical to the number estimated in 2003. Small game hunters most often sought cottontail rabbits, tree squirrels, and ruffed grouse. For most species, the number of hunters and their harvest did not change significantly between 2003 and 2004. The exceptions included fewer people hunting grouse (7% decline) and fewer grouse (-37%) and squirrels (-20%) harvested. The number of people hunting small game was nearly unchanged from 2003 but has declined about 65% since the mid-1950s. The primary reasons people hunted small game were to recreate, spend time with friends and family, relax, and feel close to nature. The mean age small game license buyers started to hunt was about 13 years. About 75% of small game hunters in 2004 were first introduced to the sport of hunting by hunting small game species. The mean age of people that went afield to hunt small game in 2004 was 42 years. About 80% of the hunters between 45 and 69 years of age had started hunting small game species, but the proportion declined slightly among hunters younger than 45 years of age. Younger small game hunters were more likely to have been introduced to hunting by hunting big game than older hunters.

INTRODUCTION

The Michigan Department of Natural Resources (DNR) has the authority and responsibility to protect and manage the wildlife resources of the State of Michigan. This responsibility is

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shared with the U.S. Fish and Wildlife Service (USFWS) for the management of migratory species such as woodcock (*Scolopax minor*). Harvest surveys are one of the management tools used by the Wildlife Division to accomplish its statutory responsibility. Estimates derived from harvest surveys, as well as breeding bird counts and population modeling, are used to monitor game populations and establish harvest regulations.

Since the 1950s, the primary small game species harvested in Michigan have been ring-necked pheasant (*Phasianus colchicus*), ruffed grouse (*Bonasa umbellus*), American woodcock, cottontail rabbit (*Sylvilagus floridanus*), snowshoe hare (*Lepus americanus*), tree squirrels (*Sciurus* spp. and *Tamiasciurus hudsonicus*), and American crow (*Corvus brachyrhynchos*) (Frawley 2003). Most of these animals could be harvested during fall and early winter (Table 1) by a person possessing a small game hunting license (includes resident, nonresident, 3-day nonresident, resident junior, and senior small game hunting licenses). Woodcock hunters have been required to register with the National Migratory Bird Harvest Information Program (HIP) since 1995. Landowners and their families that hunted small game on their property could hunt without a hunting license, although they still needed to register with HIP if they hunted woodcock.

The Harvest Information Program is a cooperative effort between state wildlife agencies and the USFWS. It was implemented to improve knowledge about harvest of migratory game birds (e.g., woodcock). Beginning in 1995, any person who hunted migratory game birds in Michigan was required to register with HIP and answer several questions about their hunting experience during the previous year. The Harvest Information Program provided the USFWS with a national registry of migratory bird hunters from which they can select participants for harvest surveys.

Estimating harvest, hunter numbers, and hunting effort were the primary objectives of the small game harvest survey. This survey also provided an opportunity to collect information about management issues. Questions were added to the questionnaire to investigate hunter recruitment and retention among small game hunters. In addition, the rate of compliance with HIP registration was determined for woodcock hunters.

In 2004, Michigan held its first modern hunting season for doves (*Zenaida macroura*). A separate survey was conducted to estimate hunting participation, harvest, and effort for the mourning dove hunting season (Frawley 2005), and the results of the dove hunting survey are not presented in this report.

METHODS

Following the 2004 hunting seasons, a questionnaire was sent to 9,981 randomly selected people that had purchased a small game hunting license. All licensees had an equal chance of being included in the random sample. After the sample was selected, licensees were grouped into one of four strata on the basis of their residence. Residents of the Upper Peninsula (UP), northern Lower Peninsula (NLP), southern Lower Peninsula (SLP), and nonresidents were grouped into separate strata (Figure 1). Up to two follow-up questionnaires were sent to non-respondents. Questionnaires were undeliverable to

228 people, primarily because of changes in residence. Questionnaires were returned by 6,096 of 9,753 people receiving the questionnaire (63% response rate).

Estimates were calculated using a stratified random sampling design (Cochran 1977). Using stratification, hunters were placed into similar groups based on county of residence (strata), and then estimates were derived for each group. The statewide estimate was then derived by combining group estimates so that the influence of each group matched the frequency its members occurred in the population of hunters. The primary reason for using a stratified sampling design was to produce more precise estimates. Improved precision means similar estimates should be obtained if this survey were to be repeated.

Estimates were calculated along with their 95% confidence limit (CL). In theory, this confidence limit can be added and subtracted from the estimate to calculate the 95% confidence interval. The confidence interval is a measure of the precision associated with the estimate and implies the true value would be within this interval 95 times out of 100. Unfortunately, there are several other possible sources of error in surveys that are probably more serious than theoretical calculations of sampling error. They include failure of participants to provide answers (nonresponse bias), question wording, and question order. It is very difficult to measure these biases. Thus, estimates were not adjusted for possible bias. Furthermore, harvest estimates did not include animals taken legally outside the open season (e.g., nuisance animals) and by unlicensed landowners and their family that legally hunted on their own land.

Statistical tests are used routinely to determine the likelihood that the differences among estimates are larger than expected by chance alone. The overlap of 95% confidence intervals was used to determine whether estimates differed. Non-overlapping 95% confidence intervals was equivalent to stating that the difference between the means was larger than would be expected 995 out of 1,000 times, if the study had been repeated (Payton et al. 2003).

RESULTS AND DISCUSSION

License sales and hunter participation

In 2004, 306,526 people purchased small game hunting licenses, a decline of about 6% from 2003 (Table 2). About 69% (±1%) of the licensees actually hunted (Table 3). An estimated 210,455 people hunted small game species in 2004, a decline of about 1% from 2003 (Table 3). About 97% of the small game hunters were males (Table 3). Hunters most often sought cottontail rabbits, tree squirrels, and ruffed grouse (Table 4). In 2004, the average age of small game license buyers was 41 years (Figure 2). Nearly 11% (33,917) of the license buyers were younger than 17 years old.

Harvest and hunting trends

The only species that had significantly fewer hunters pursuing them statewide in 2004 than during 2003 was ruffed grouse. Grouse hunter numbers declined 7% statewide between

2003 and 2004 (Table 4). Although other species had larger changes in hunter numbers between years than grouse (e.g., quail [*Colinus virginianus*] and crow), hunter numbers were not significantly different for these other species. These larger differences were not significant because estimates were less precisely estimated (i.e., larger confidence intervals).

Hunting effort did not differ significantly for any species between 2003 and 2004 (Table 5). In contrast, harvest declined significantly statewide for grouse and squirrels between 2003 and 2004 (Table 6). Harvest declined 37% for grouse and 20% for squirrels statewide.

The overall number of people hunting small game in 2004 was nearly identical to the number estimated in 2003 (Table 3) but has declined 65% since the mid-1950s (Figure 3). This trend has been previously reported in Michigan and nationally (Brown et. al. 2000, Enck et al. 2000, Frawley 2001, U.S. Department of the Interior 2002). Hawn (1979) speculated declining ring-necked pheasant populations was the primary reason for declining small game hunter numbers in Michigan. The number of people hunting pheasants has declined by nearly 90% between the mid-1950s and recent years (Figure 4). Many other factors have contributed to the decline of small game hunting, including increased urbanization of the human population, increased competition between hunting and other leisure activities, and loss of wildlife habitat (Brown et al. 2000).

Declining participation since the mid-1950s also has been noted among hunters pursuing cottontail rabbits (-75%), snowshoe hare (-70%), and squirrels (-60%). Changes in hunter participation and harvest were generally similar.

Changes in the harvest of game species and hunter participation usually track changes in game populations. The number of hunters that pursued pheasants, rabbits, snowshoe hares, and squirrels was near record low levels during recent years (Figure 4). Game population surveys have indicated pheasant, quail, and woodcock populations are currently among their lowest recorded levels since the 1960s (Tuovila et al. 2003, Frawley et al. 2004, Kelley and Rau 2005). The abundance of rabbit, hare, and squirrels was not monitored annually; thus, it was not possible to determine whether harvest and population trends were similar. Michigan's grouse population generally follows a cyclic pattern that lasts about 10 years, and currently, the grouse population appears to be near the lows in the cycle (Frawley et al. 2004). Hunter numbers and the number of grouse harvested have followed a similar cyclic pattern.

Although many small game species are not as abundant today as during previous decades (e.g., pheasant, quail, woodcock), the mean number of animals taken per hunting effort has not paralleled changes in the population (Figure 5). Thus, hunting efficiency is higher despite declining numbers of pheasant, quail, and woodcock.

Extended pheasant hunting season

In 2004, the pheasant season was extended in Zone 3 (Figure 1) from December 15 to January 1. About 22% of the pheasant hunters statewide participated in the late season

(Table 7). The hunting effort by these hunters represented about 16% of the hunting effort statewide, and these hunters harvested about 14% of the pheasants statewide.

Hunter recruitment and retention

The primary reasons people hunted small game were to recreate, spend time with friends and family, relax, and feel close to nature (Table 8). The age of the hunter did not change the relative importance of these main reasons for hunting small game (Figure 6). Managing wildlife and providing food were their lowest ranked reasons for hunting. Hunters less than 20 years old placed more importance on providing food as a factor for hunting small game than older hunters (Figure 6). Previous research about hunters' motives for hunting has reported young hunters generally were more oriented towards achievement than older hunters (Responsive Management 2003).

The mean age small game license buyers started to hunt was 13.4 ± 0.2 years, and the mean age varied little among hunters older than 19 years of age (Figure 7). Several studies have reported initiation into hunting usually occurs before the age of 20 (Responsive Management 2003). About 75% of small game hunters in 2004 were first introduced to the sport of hunting by hunting small game species (Table 9). About 80% of the hunters between 45 and 69 years of age had started hunting small game species (Figure 8). The proportion of hunters initiated to small game hunting declined among hunters younger than 45 years of age. Younger small game hunters were more likely to have been introduced to hunting by hunting big game than older hunters.

Most small game hunters were introduced to hunting by their parent or guardian (Table 10). Parents and guardians were identified as the most important person for introducing hunters to small game hunting for hunters of all age classes (Figure 9). Previous research has reported most youth have learned how to hunt from their father, and substantial percentages said they learned how to hunt from family members and peers (Responsive Management 2003).

Most small game license buyers hunted on private lands (77 ± 1%), although public lands were also frequently accessed for small game hunting (58 ± 1%) (Figure 10). Nearly an equal proportion of licensees hunted on land owned by themselves or their family as licensees that hunted on private land owned by an unrelated person.

The major difference between where small game hunters resided during their childhood and where they currently live was the proportion of hunters residing on farms (Figures 11 and 12). Fewer hunters currently reside on farms. As residency on farms has declined among small game hunters, there has been increased residency in rural areas not associated with farms.

Among active hunters at least 18 years old, 34 ± 2% took a youth (ages 12-16) small game hunting in 2004. Moreover, 11 ± 1% of adult small game hunters took a youth that was not related to themselves or a hunting partner small game hunting. About 28 ± 1% of adult small game hunters asked a non-hunter to join them while hunting small game in 2004.

Harvest Information Program compliance among woodcock hunters

In 2004, an estimated 78 ± 3% of the Michigan small game hunters that hunted woodcock had registered with HIP. This level was unchanged from the rate of compliance reported in 2003 (Frawley 2004). Hunters registered with HIP were responsible for an estimated 83% of the woodcock taken in 2004 (Table 11). Similarly, registered hunters were responsible for 78% of the woodcock hunting trips.

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Table 1. Small game hunting seasons in Michigan, 2004-2005.

Species, season, and area[a]	Season dates
Ring-necked pheasant	
Upper Peninsula	Oct. 10 – 31
Lower Peninsula	Oct. 20 – Nov. 14 and Dec. 1 – Jan. 1
Northern bobwhite	
Southern Lower Peninsula	Oct. 20 – Nov. 14
Ruffed grouse	
Statewide	Sept. 15 – Nov. 14 and Dec. 1 – Jan. 1
American woodcock	
Statewide	Sept. 25 – Nov. 8
Cottontail rabbit	
Statewide	Sept. 15 – March 31
Snowshoe hare	
Statewide	Sept. 15 – March 31
Squirrels	
Statewide	Sept. 15 – March 1
American crow	
Upper Peninsula	Aug. 1 – Sept. 30
Lower Peninsula	Aug. 1 – Sept. 30 and Feb. 1 – March 31

[a]See Figure 1 for boundaries of hunt areas.

Table 2. Number of small game hunting licenses sold in Michigan, 2000-2004.

Item	Year					2003-2004 % Change
	2000	2001	2002	2003	2004	
Number of licenses sold[a]	358,727	352,059	331,381	331,299	311,002	-6.1
Number of people buying a hunting license[b]	354,906	347,429	327,279	327,071	306,526	-6.3

[a]The number of licenses sold is higher than the number of people buying licenses because some people purchased multiple licenses.
[b]A person was counted only once, regardless of how many licenses they purchased.

Table 3. Estimated sex and age of active small game hunters in Michigan, 2000-2004.[a]

Variable	2000	2001	2002	2003	2004	
					Estimate	95% CL
Hunters[b]	242,458	232,054	213,406	212,593	210,455	3,521
Males (%)	97.0	96.8	97.5	97.0	97.1	1.0
Females (%)	3.0	3.2	2.5	3.0	2.9	1.0
Age (Years)[c]	40.3	40.6	41.3	41.7	42.0	0.5

[a]Analyses included only those people that hunted.
[b]People that hunted American crow, American woodcock, cottontail rabbit, northern bobwhite quail, ring-necked pheasant, ruffed grouse, snowshoe hare, or tree squirrels.
[c]The mean age was incorrectly reported for 2002 and 2003 in previous annual reports (Frawley 2003, 2004).

Table 4. Estimated number of small game hunters by species and region in Michigan, 2001-2004.[a]

Species and region	2001	2002	2003	2004 No.	2004 95% CL	2003-04 % Change
Ring-necked pheasants[b]						
UP	2,006	1,312	2,058	1,454	512	-29
NLP	23,279	21,329	21,330	20,865	1,822	-2
SLP	48,704	43,301	39,236	38,859	2,442	-1
Statewide	70,051	62,460	59,145	57,373	2,941	-3
Northern bobwhite quail						
UP						
NLP	1,000	572	742	556	289	-25
SLP	2,672	2,105	1,983	1,562	487	-21
Statewide	3,541	2,551	2,685	2,117	632	-21
Ruffed grouse						
UP	46,455	42,096	43,913	39,526	1,974	-10*
NLP	61,441	51,962	53,666	52,828	2,745	-2
SLP	17,252	13,833	13,729	11,880	1,453	-13
Statewide	116,008	100,298	103,279	96,117	3,285	-7*
American woodcock						
UP	15,379	11,713	12,263	12,531	1,439	2
NLP	29,397	25,407	26,522	28,249	2,132	7
SLP	10,587	8,401	8,446	7,867	1,183	-7
Statewide	50,618	41,512	43,270	44,525	2,663	3
Cottontail rabbits						
UP	4,878	3,801	4,244	4,884	915	15
NLP	36,036	29,976	30,726	31,617	2,140	3
SLP	71,978	65,761	67,022	68,966	2,953	3
Statewide	106,378	94,977	95,758	99,503	3,505	4
Snowshoe hares						
UP	14,202	10,649	10,192	10,468	1,299	3
NLP	16,040	11,388	10,322	11,940	1,422	16
SLP	1,658	1,411	1,289	1,289	486	0
Statewide	30,855	22,915	21,137	22,949	1,959	9
Squirrels						
UP	5,261	4,217	5,582	6,114	1,010	10
NLP	45,589	36,549	43,795	39,457	2,369	-10
SLP	56,705	54,863	59,833	58,243	2,805	-3
Statewide	100,597	90,074	101,141	97,427	3,502	-4
American crows						
UP	1,922	1,575	1,304	1,816	569	39
NLP	7,880	6,363	6,321	6,532	1,065	3
SLP	12,638	9,902	8,886	9,953	1,323	12
Statewide	21,641	17,179	15,743	17,703	1,773	12

[a]The number of hunters does not add up to the statewide total because hunters can hunt in more than one region.
[b]Included both regular and late seasons; see Table 7 for separate estimates for each season.
*Non-overlapping 95% confidence intervals indicated estimates differed significantly (P<0.005).

Table 5. Estimated amount of small game hunter effort (days afield) by species and region, 2001-2004.

Species and region	2001	2002	2003	2004 No.	2004 95% CL	2003-04 % Change
Ring-necked pheasants[a]						
UP	8,407	4,701	10,709	7,034	3,575	-34
NLP	88,541	79,316	75,451	86,561	11,746	15
SLP	180,933	181,130	158,569	175,842	17,336	11
Statewide	277,880	265,147	244,729	269,437	21,724	10
Northern bobwhite quail						
UP						
NLP	3,901	2,187	2,140	1,700	1,149	-21
SLP	11,811	9,002	8,802	5,145	2,147	-42
Statewide	15,712	11,189	10,942	6,845	2,913	-37
Ruffed grouse						
UP	404,393	400,064	399,926	411,602	33,558	3
NLP	339,643	348,828	326,222	332,652	27,741	2
SLP	84,600	75,240	79,709	65,337	15,338	-18
Statewide	828,636	824,131	805,857	809,591	46,944	<1
American woodcock						
UP	105,801	87,336	81,133	106,482	17,319	31
NLP	162,176	158,382	172,575	172,731	20,269	0
SLP	55,196	41,632	47,334	36,521	8,202	-23
Statewide	323,173	287,350	301,043	315,734	28,870	5
Cottontail rabbits						
UP	27,305	26,385	27,346	43,963	21,679	61
NLP	229,330	201,293	192,501	236,673	29,776	23
SLP	478,608	437,672	488,554	502,642	46,195	3
Statewide	735,243	665,350	708,401	783,277	61,602	11
Snowshoe hares						
UP	99,217	78,592	66,290	82,961	16,687	25
NLP	110,851	89,101	64,906	88,711	19,557	37
SLP	21,218	5,675	9,124	6,479	4,032	-29
Statewide	231,286	173,368	140,320	178,151	26,772	27
Squirrels						
UP	32,955	39,827	52,151	59,363	22,892	14
NLP	275,349	225,554	292,974	273,883	32,590	-7
SLP	350,533	322,951	402,981	378,893	33,845	-6
Statewide	658,837	588,333	748,107	712,139	53,397	-5
American crows						
UP	9,189	7,695	7,228	10,266	5,282	42
NLP	38,371	29,941	47,419	33,664	9,322	-29
SLP	72,658	53,665	45,776	69,872	20,337	53
Statewide	120,219	91,301	100,423	113,802	24,093	13

[a]Included both regular and late seasons; see Table 7 for separate estimates for each season.

Table 6. Estimated small game harvest by species and region in Michigan, 2001-2004.

Species and region	2001	2002	2003	2004 No.	2004 95% CL	2003-04 % Change
Ring-necked pheasants[a]						
UP	4,781	1,539	6,289	1,208	801	-81*
NLP	36,400	37,134	43,044	35,603	6,005	-17
SLP	80,502	72,371	86,829	64,647	9,158	-26*
Statewide	121,682	111,043	136,162	101,458	11,350	-25
Northern bobwhite quail						
UP						
NLP	1,124	538	689	227	239	-67
SLP	3,263	2,336	1,672	2,737	2,186	64
Statewide	4,387	2,874	2,361	2,964	2,254	26
Ruffed grouse						
UP	219,541	171,268	211,514	119,183	14,145	-44*
NLP	136,760	126,797	126,846	90,028	10,177	-29*
SLP	24,555	16,238	19,967	16,720	9,596	-16
Statewide	380,857	314,303	358,326	225,930	20,091	-37*
American woodcock						
UP	46,658	34,130	37,290	26,556	6,767	-29
NLP	82,266	76,407	83,047	71,219	12,195	-14
SLP	25,331	15,845	18,894	18,898	6,508	0
Statewide	154,255	126,382	139,231	116,673	15,900	-16
Cottontail rabbits						
UP	3,954	6,988	9,697	17,227	19,810	78
NLP	122,253	100,707	123,705	101,699	16,101	-18
SLP	385,028	362,398	412,205	393,882	36,660	-4
Statewide	511,235	470,093	545,607	512,808	45,562	-6
Snowshoe hares						
UP	61,760	31,740	40,121	22,907	1,425	-43*
NLP	46,871	20,349	25,344	19,100	887	-25*
SLP	13,717	3,474	3,258	1,587	13,526	-51
Statewide	122,349	55,563	68,723	43,594	9,958	-37
Squirrels						
UP	43,019	22,786	49,062	36,271	13,526	-26
NLP	279,005	205,393	289,581	209,168	22,050	-28*
SLP	322,510	318,984	376,294	329,735	33,705	-12
Statewide	644,534	547,164	714,937	575,174	43,705	-20*
American crows						
UP	8,824	4,666	9,668	5,144	2,924	-47*
NLP	31,725	37,841	27,341	20,714	8,650	-24
SLP	75,599	50,235	42,603	60,906	27,482	43
Statewide	116,148	92,742	79,612	86,764	29,259	9

[a]Included both regular and late seasons; see Table 7 for separate estimates for each season.
*Non-overlapping 95% confidence intervals indicated estimates differed significantly (P<0.005).

Table 7. Estimated number of pheasant hunters, pheasants harvested, and hunting effort (days afield) in the regular and late hunting seasons in Michigan, 2004.

	Hunters		Days afield		Harvest	
Season and region	No.	95% CL	No.	95% CL	No.	95% CL
Regular[a]						
UP	1,456	512	7,048	3,575	1,215	801
NLP	20,742	1,815	82,875	11,193	34,467	5,868
SLP	35,955	2,363	136,244	12,663	51,379	7,383
Statewide	54,797	2,890	226,167	17,677	87,061	9,862
Late[b]						
NLP	1,338	497	3,813	1,990	1,292	771
SLP	11,701	1,451	39,457	7,752	13,104	3,258
Statewide	12,740	1,514	43,270	8,203	14,397	3,403

[a]Regular season was October 10-31 in the UP and October 20-November 14 in the LP.
[b]December 1 – January 1 in the LP.

Table 8. The importance of the following reasons in decision to hunt small game in Michigan during the last 5 years.

	Very important		Important		Slightly important		Not important		Not sure		No answer	
Reason to hunt	%	95% CL	%	95% CL	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Recreation	48	1	33	1	9	1	3	<1	<1	<1	6	1
Be with friends & family	50	1	28	1	8	1	5	1	1	<1	8	1
Manage wildlife	14	1	24	1	25	1	21	1	4	1	12	1
Feel close to nature	45	1	33	1	10	1	3	<1	1	<1	8	1
Relaxation	46	1	33	1	9	1	4	<1	1	<1	8	1
Food	21	1	23	1	25	1	21	1	2	<1	8	1

Table 9. Type of hunting done by small game hunters when they first started to hunt.

	2004 small game license buyers				Licensees that hunted small game in 2004			
Type of hunting	%	95% CL	No.	95% CL	%	95% CL	No.	95% CL
Small game	72	1	221,893	3,404	76	1	159,240	3,791
Big game	12	1	36,919	2,476	10	1	21,247	1,933
Waterfowl	3	<1	10,664	1,398	2	<1	5,207	987
Turkey	<1	<1	1,301	494	<1	<1	851	400
Furbearers	1	<1	4,375	904	2	<1	3,269	783
No answer	10	1	31,375	2,307	10	1	20,841	1,917

Table 10. Person that introduced small game hunters to hunting.

	2004 small game license buyers				Licensees that hunted small game in 2004			
Person	%	95% CL	No.	95% CL	%	95% CL	No.	95% CL
Parent or guardian	67	1	204,303	3,580	68	1	142,839	3,780
Other family member	13	1	40,037	2,567	13	1	26,549	2,144
Friend or mentor	10	1	31,087	2,296	9	1	19,808	1,873
Themselves	6	1	17,628	1,773	6	1	12,510	1,507
Other	1	<1	3,716	833	1	<1	2,312	659
No answer	3	<1	9,755	1,338	3	1	6,638	1,109

Table 11. Estimated number of Michigan woodcock hunters, woodcock harvested, and hunting effort (days afield) among people that registered with the Harvest Information Program, 2004.[a]

Variable	No.	95% CL
Hunters	34,471	2,387
Days afield (effort)	246,199	25,450
Harvest	96,500	14,414

[a]Analyses limited to people that registered with HIP and hunted.

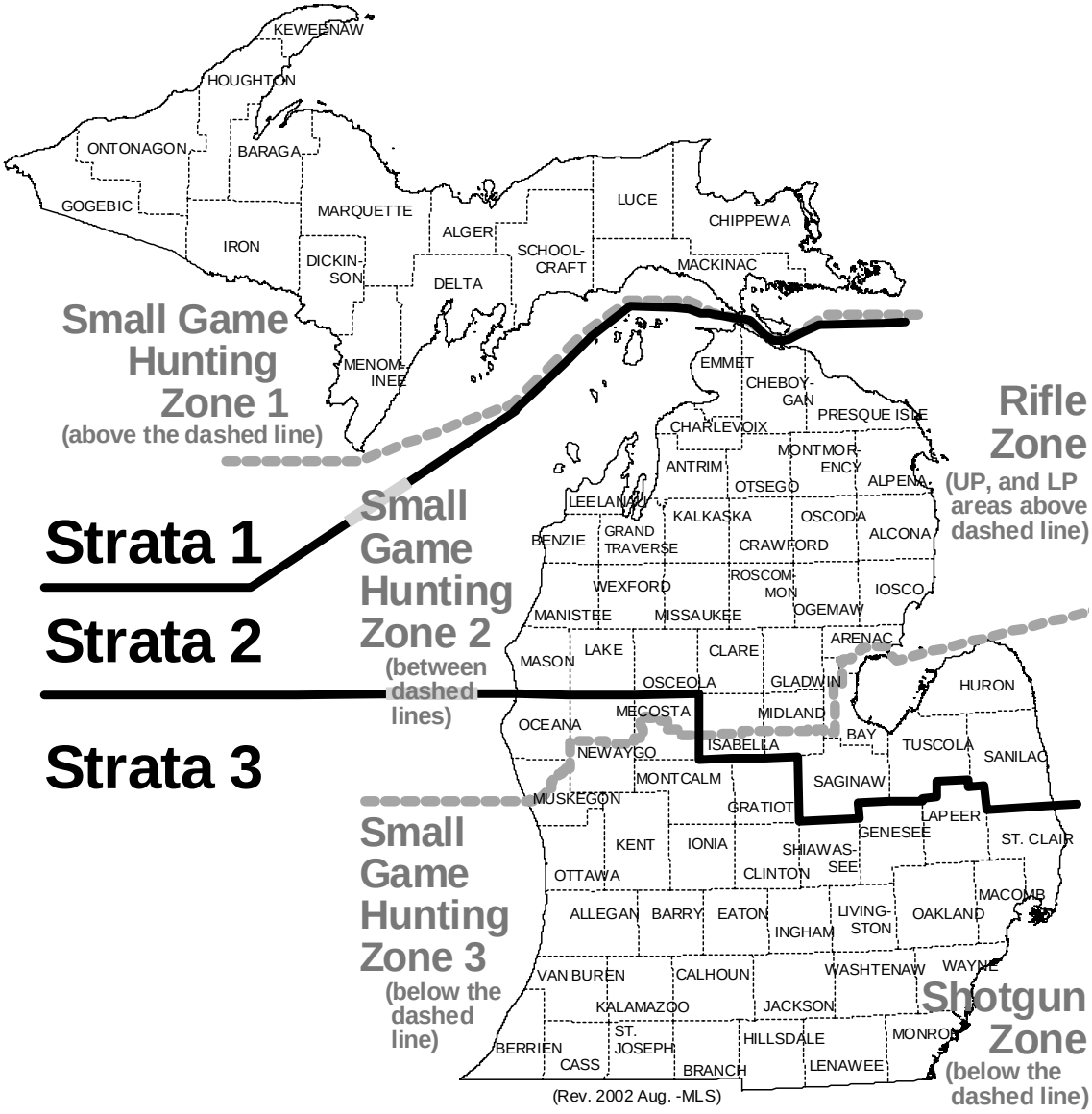

Figure 1. Areas (strata) used to summarize the survey data (top). Stratum boundaries did not match the small game management hunting zones.

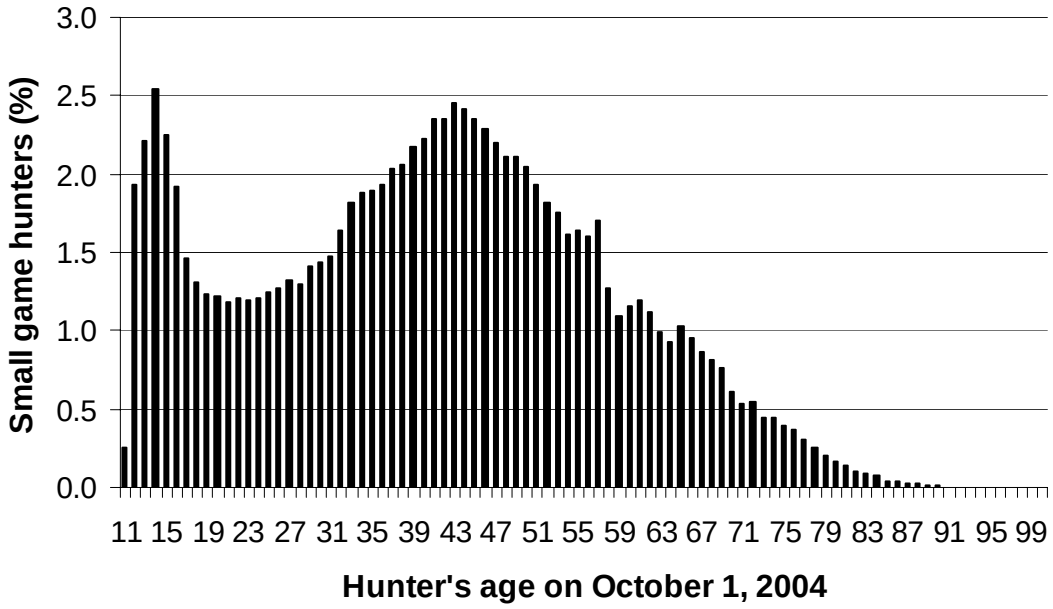

Figure 2. Age of people that purchased a small game hunting license in Michigan for the 2004 hunting seasons ($\bar{x}$ = 41 years).

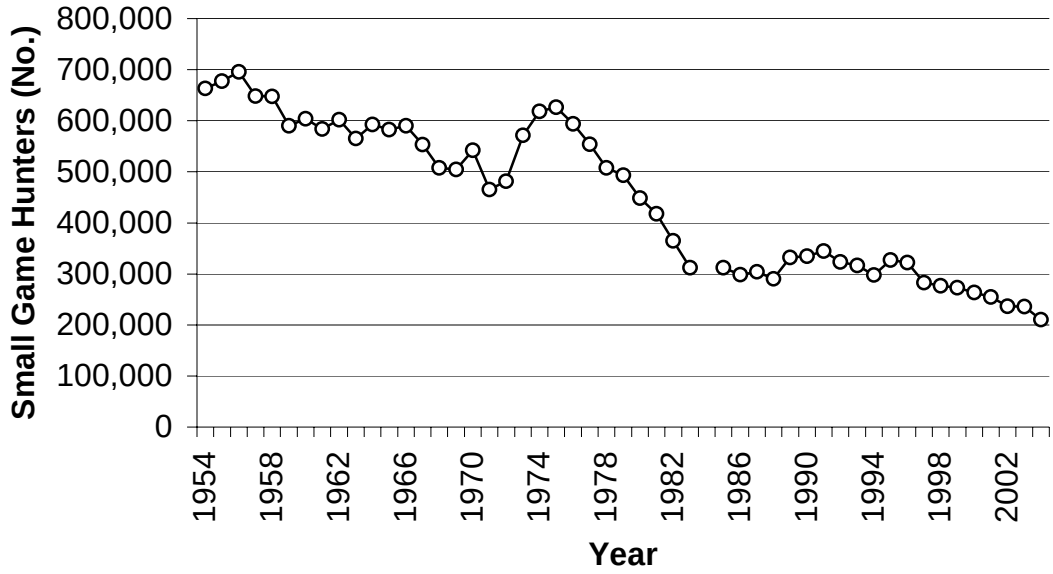

Figure 3. Estimated number of small game hunters in Michigan, 1954-2004 (estimate of the number of people that went afield). No estimate was available for 1984.

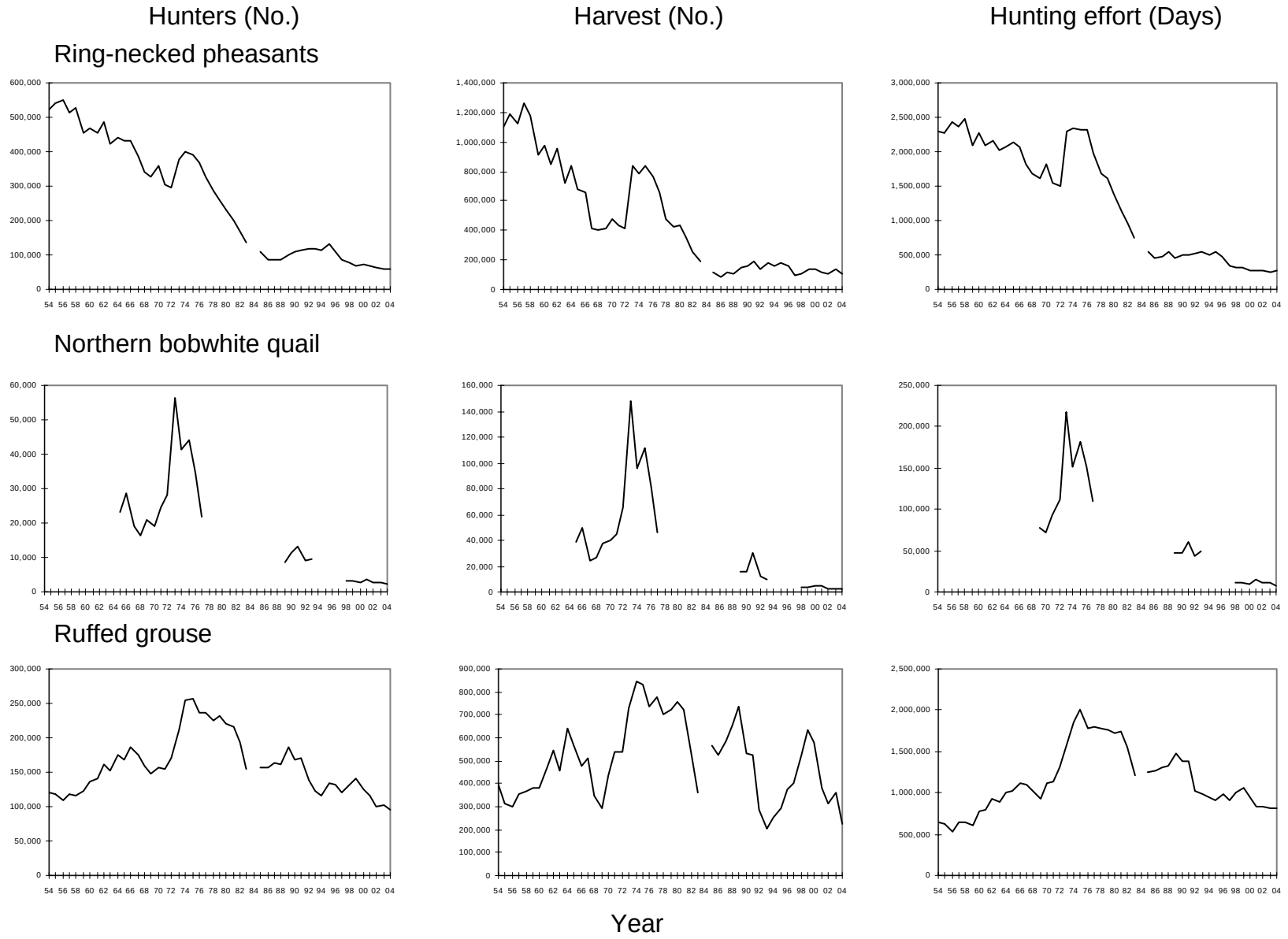

Figure 4. Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2004. No estimates were available or no seasons existed during years when no data are plotted.

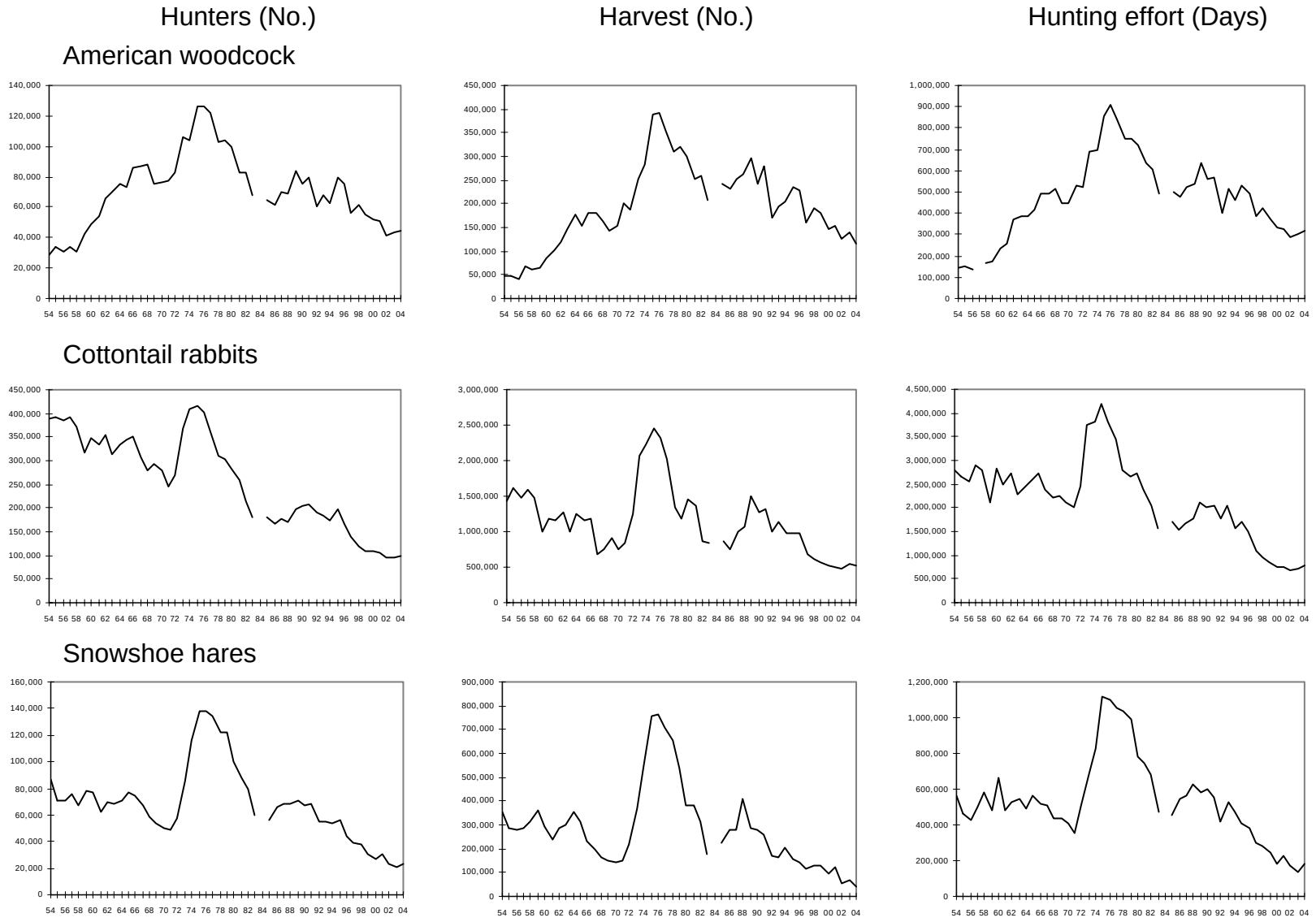

Figure 4 (continued). Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2004. No estimates were available or no seasons existed during years when no data are plotted.

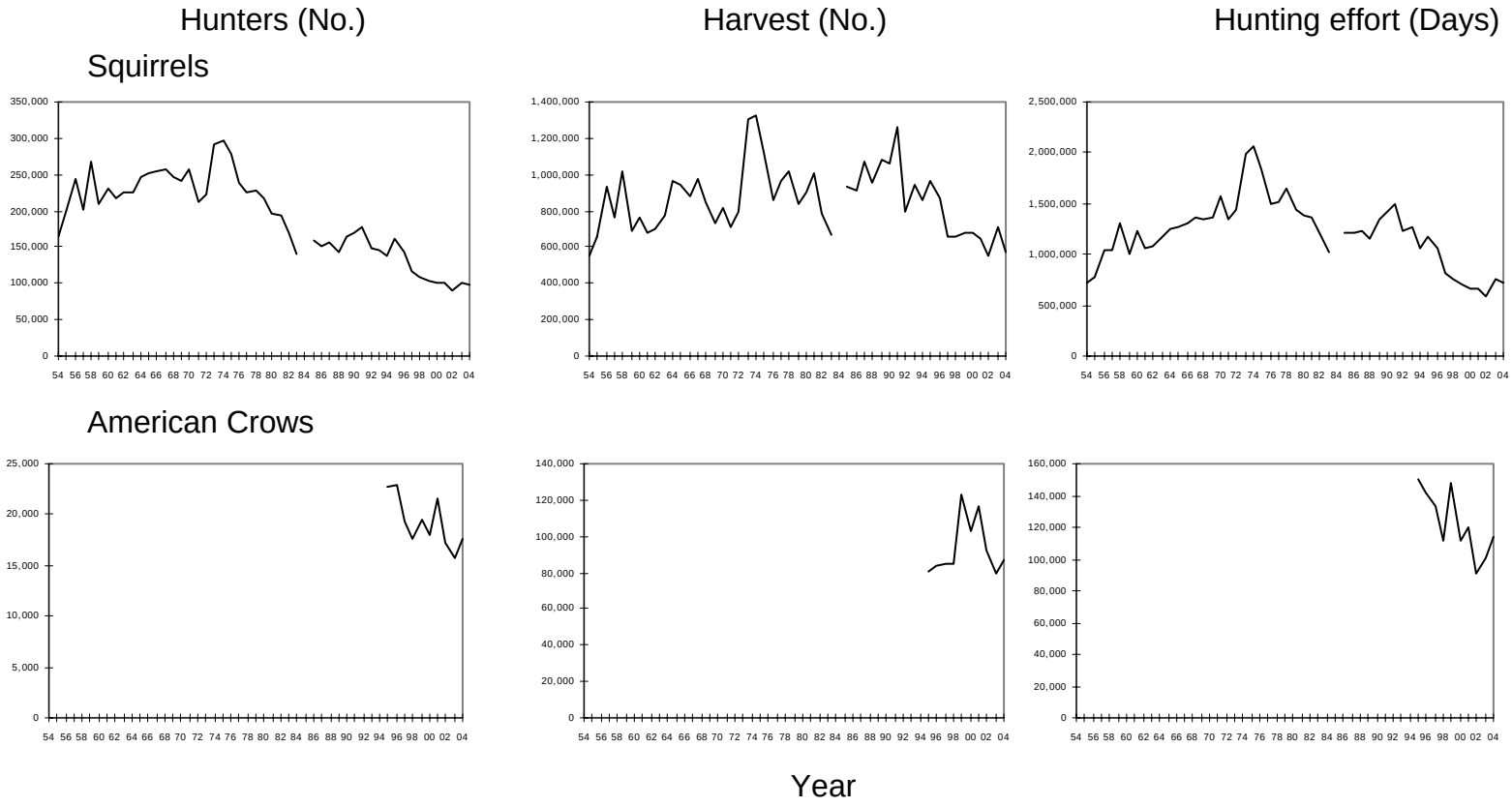

Figure 4. (continued) Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2004. No estimates were available or no seasons existed during years when no data are plotted.

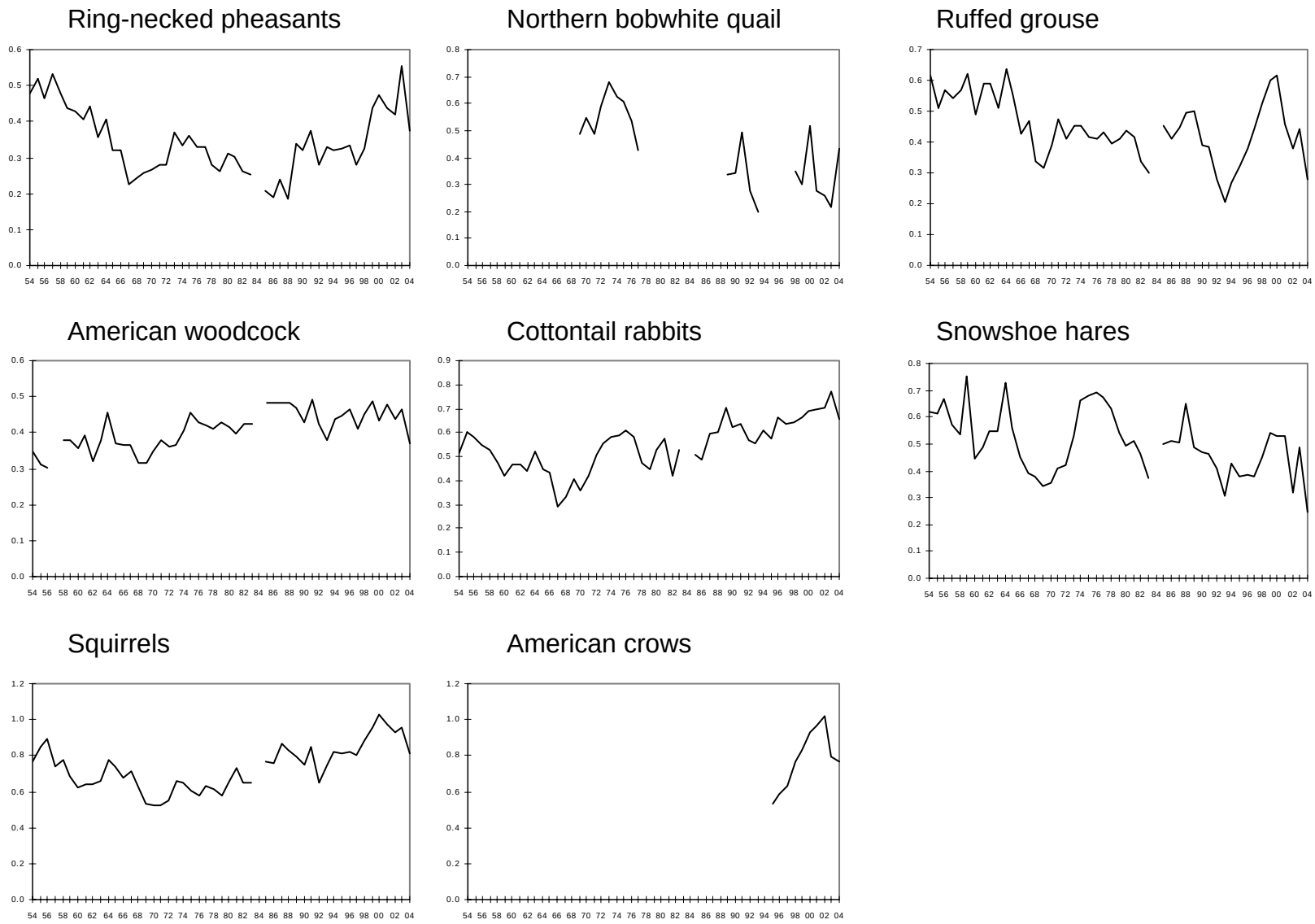

Figure 5. Estimated harvest per effort in Michigan during the small game hunting seasons, 1954-2004. No estimates were available or no seasons existed during years when no data are plotted.

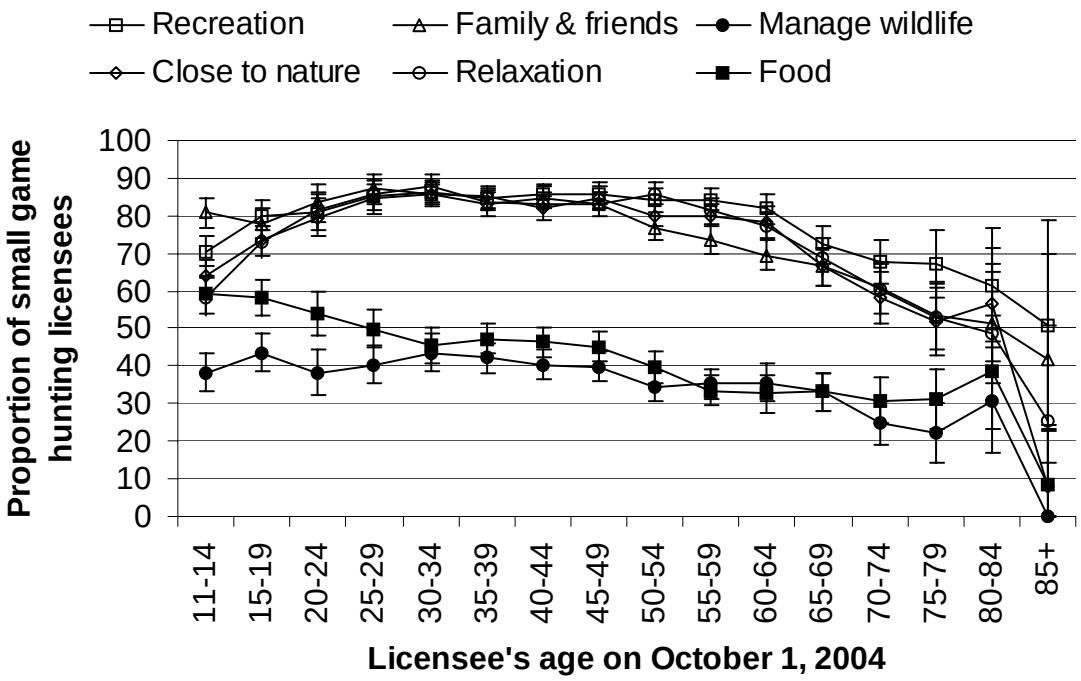

Figure 6. Proportion of small game license buyers that indicated various reasons were very important or important in their decision to hunt small game in Michigan during the last five years, summarized by age of licensee in 2004.

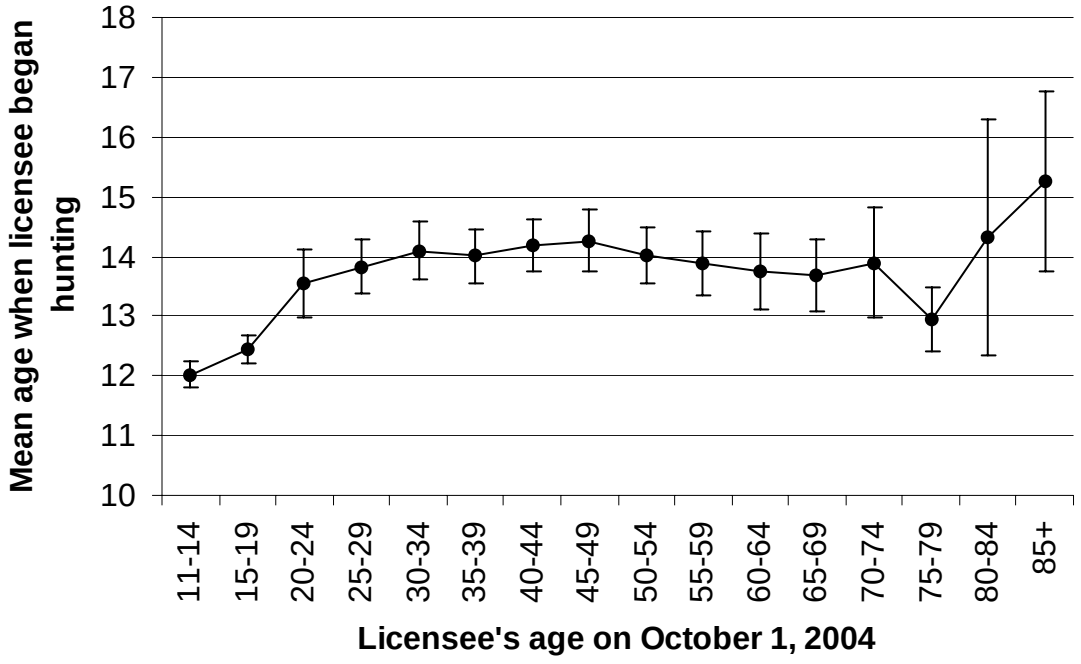

Figure 7. Mean age when small game license buyers started to hunt, summarized by age of licensee in 2004.

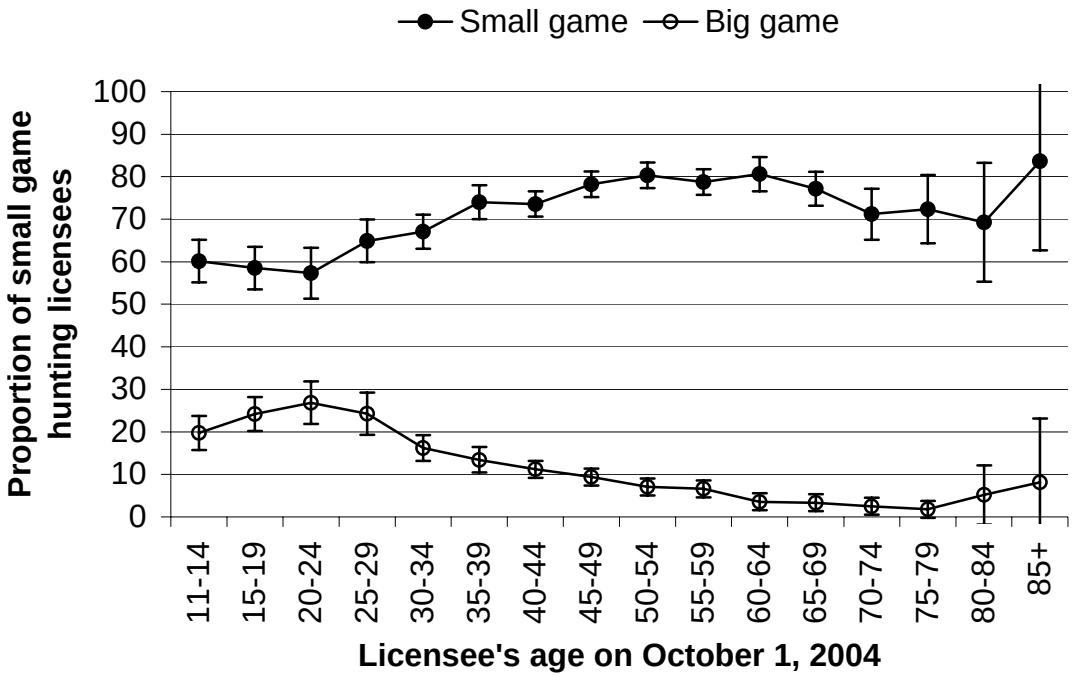

Figure 8. Proportion of small game licensees that initially hunted small game species or big game species when they were introduced to hunting, summarized by age of licensee in 2004.

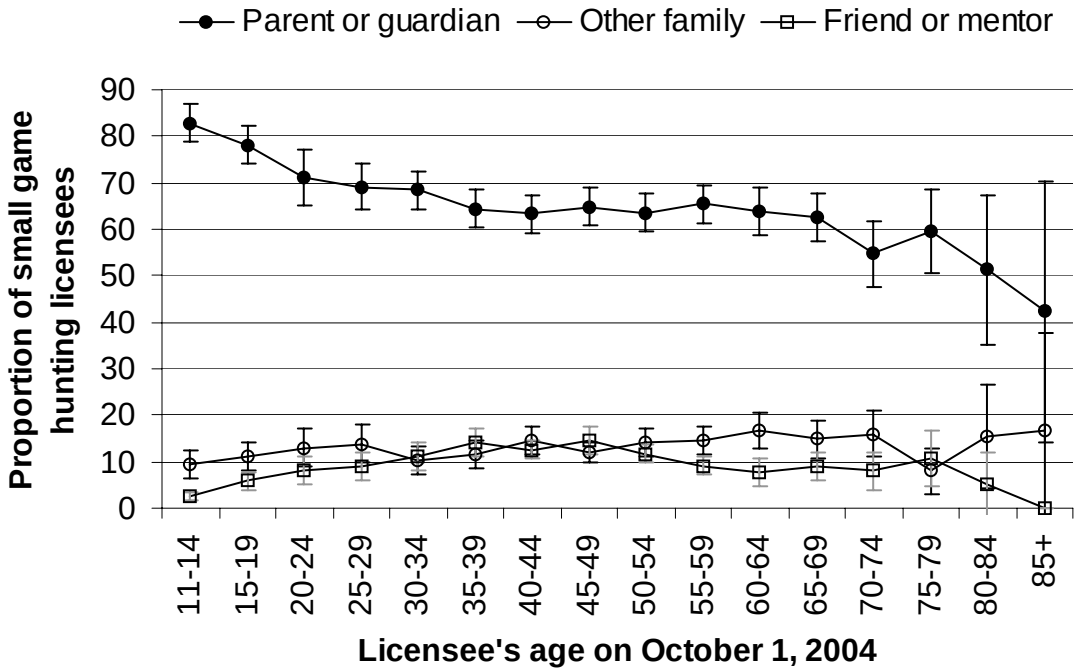

Figure 9. Proportion of small game licensees that were introduced to hunting by a parent or guardian, other family member, or a friend or mentor, summarized by age of licensee in 2004.

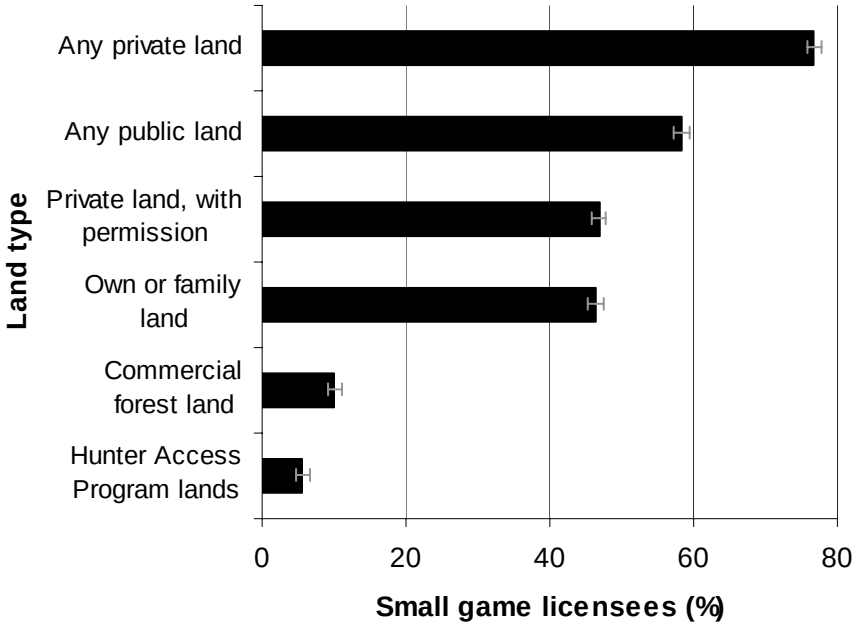

Figure 10. Land type where small game hunters usually hunt.

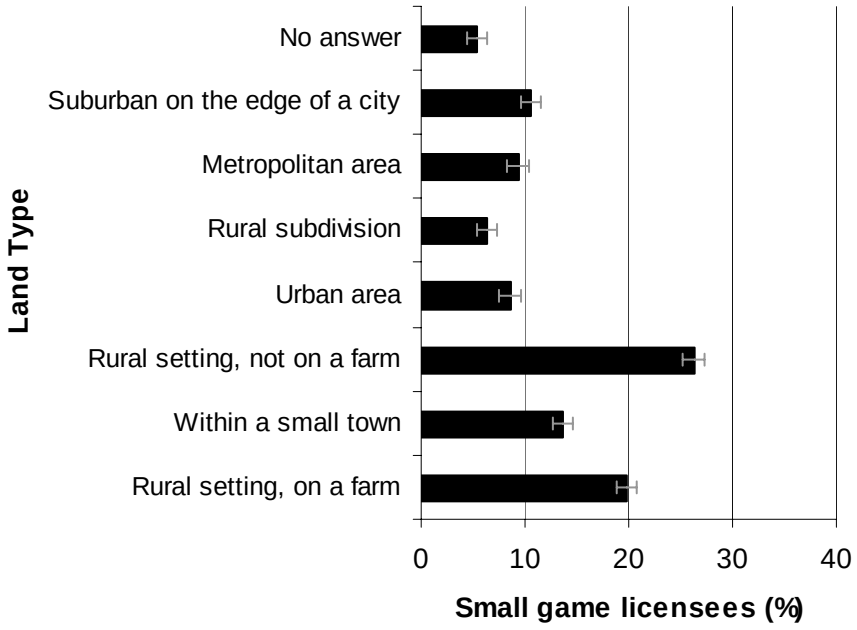

Figure 11. The type of land where small game licensees lived during most of their childhood.

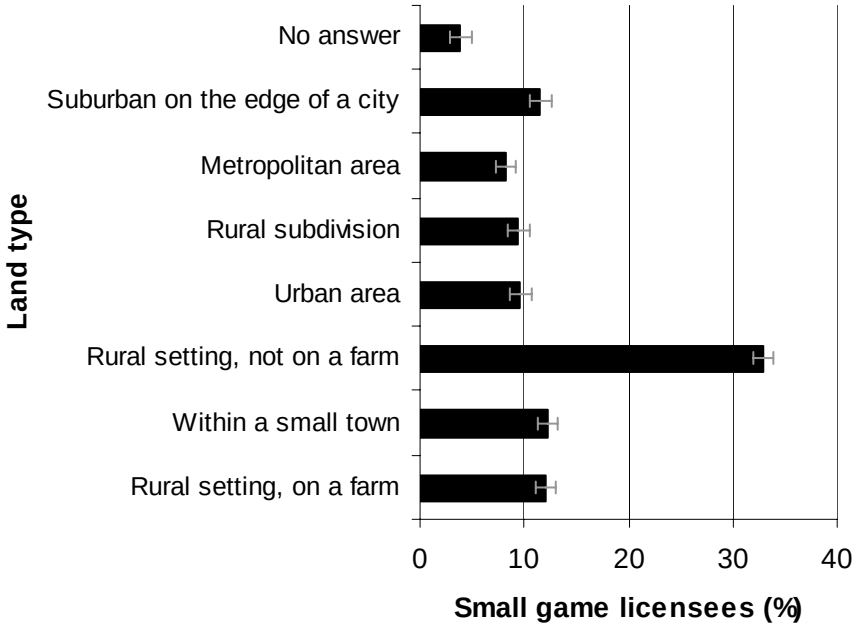

Figure 12. The type of land where small game licensees lived in 2004.